

U.S. Patent Application Serial No. 10/030,095
Amendment dated February 27, 2004
Reply to OA of October 27, 2003

IN THE CLAIMS

Please cancel claim 10 without prejudice or disclaimer.

Please amend claims 3-8, 11 and 12 and add new claims 13-15 as follows:

Claims 1-3 (Canceled).

Claim 4 (Currently Amended): The multi-layer resin tube according to ~~claim 10~~ any one of claims 13 or 15, ~~wherein the~~ said body layer comprises a polyamide.

Claim 5 (Currently Amended): The multi-layer resin tube according to claim ~~10~~ 13, ~~wherein the~~ said barrier component is a fluorine resin, and ~~the~~ said adhesive component is a modified fluorine resin.

Claim 6 (Currently Amended): The multi-layer resin tube according to ~~claim 10~~ any one of claims 13 or 15, ~~wherein the~~ said barrier component is an ethylene-tetrafluoroethylene copolymer and ~~the~~ said adhesive component is a modified ethylene-tetrafluoroethylene copolymer.

Claim 7 (Currently Amended): The multi-layer resin tube according to ~~claim 10~~ any one of claims 13 or 15, ~~wherein the~~ said barrier component is an ethylene-tetrafluoroethylene copolymer blended with a conductive filler.

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Claim 8 (Currently Amended): The multi-layer resin tube according to claim ~~10~~ 7, wherein the said conductive filler is carbon black.

Claims 9 and 10 (canceled).

Claim 11 (Currently Amended): The multi-layer resin tube according to ~~claim 10~~ any one of claims 13 to 15, wherein the said outermost fractional gradient layer ~~includes~~ comprises said the barrier component at a concentration of 0.1 to 30 % by weight, and ~~wherein the~~ said innermost fractional gradient layer ~~includes the~~ comprises said adhesive ~~layer~~ component at a concentration of 0.1 to 30 % by weight.

Claim 12 (Currently Amended): The multi-layer resin tube according to claim ~~10~~ 11, wherein the said outermost fractional layer ~~includes the~~ comprises said barrier component at a concentration of 1 to 10 % by weight, and ~~wherein the~~ said innermost fractional layer ~~includes the~~ comprises said adhesive ~~layer~~ component at a concentration of 0.5 to 3 % by weight.

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Claim 13 (New): A multi-layer resin tube for use as a fuel tube for automobiles, the multi-layer resin tube comprising:

a body layer comprising a thermoplastic resin; and

a barrier layer provided on an inner surface of said body layer, said barrier layer comprising

a plurality of gradient layers, each of said gradient layers comprising an adhesive component and a barrier component for controlling fuel permeability, said plurality of gradient layers comprising:

an outermost gradient layer provided on said inner surface of said body layer;

an innermost gradient layer which defines an inside surface of said multi-layer resin tube, and

optionally, one or more intermediate gradient layers provided between said outermost layer and said innermost layer,

wherein, said adhesive component is present in said plurality of gradient layers at a concentration that decreases in each sequential gradient layer from said outermost gradient layer having a highest concentration, to said innermost gradient layer having a lowest concentration of adhesive component, and

said barrier component is present in said plurality of gradient layers at a concentration that increases in each sequential gradient layer from said outermost gradient layer having a lowest concentration, to said innermost gradient layer having a highest concentration of barrier component.

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Claim 14 (New): The multi-layer resin tube of claim 13, said barrier layer does not comprise a polyamide.

Claim 15 (New): A multi-layer resin tube for use as a fuel tube for automobiles, the multi-layer resin tube comprising:

a body layer comprising a thermoplastic resin; and

a barrier layer provided on an inner surface of said body layer, said barrier layer consisting of a plurality of gradient layers, each consisting of a modified fluorine resin adhesive component, and a fluorine resin barrier component optionally containing a conductive filler, said plurality of gradient layers comprising:

an outermost gradient layer provided on said inner surface of said body layer;

an innermost gradient layer which defines an inside surface of said multi-layer resin tube, and

optionally, one or more intermediate gradient layers provided between said outermost layer and said innermost layer,

wherein, said adhesive component is present in said plurality of gradient layers at a concentration that decreases in each sequential gradient layer from said outermost gradient layer having a highest concentration, to said innermost gradient layer having a lowest concentration of adhesive component, and

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said barrier component is present in said plurality of gradient layers at a concentration that increases in each sequential gradient layer from said outermost gradient layer having a lowest concentration, to said innermost gradient layer having a highest concentration of barrier component.